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101st Congress
1st Session

HOUSE OF REPRESENTATIVES

Rept. 101-241
Part 2

OIL POLLUTION PREVENTION, RESPONSE, LIABILITY, AND COMPENSATION ACT OF 1989

September 22, 1989.—Ordered to be printed

Mr. Roe, from the Committee on Science, Space, and Technology, submitted the following

REPORT

together with

DISSENTING VIEWS

[To accompany H.R. 3027 which on July 27, 1989 was referred jointly to the Committees on Public Works and Transportation, Merchant Marine and Fisheries, and Science, Space, and Technology]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 3027) to provide liability for damages resulting from oil pollution, to establish a fund for the payment of compensation for such damages, to improve oil pollution prevention and response, and for other purposes, having considered the same, report favorably thereon with amendments and recommend that the bill do pass.

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The amendments are as follows:

In section 202(C)(2) insert a new paragraph (C) as follows:

(C) A clearly designated chain of command and authority to execute such plan in the event of discharge or threatened discharge of order.

In section 202(C)(2) redesignate subparagraph (C) as subparagraph (D).

Strike section 211, and insert in lieu thereof the following:

SEC. 211. OIL POLLUTION RESEARCH AND DEVELOPMENT PROGRAM.

(a) INTERAGENCY COORDINATING COMMITTEE ON OIL POLLUTION RESEARCH.—

(1) ESTABLISHMENT.—There is established an Interagency Coordinating Committee on Oil Pollution Research (hereafter in this section referred to as the "Interagency Committee").

(2) PURPOSES.—The Interagency Committee shall coordinate a comprehensive program of oil pollution research, development, and demonstration among the Federal agencies, in cooperation and coordination with industry, universities, research institutions, and other nations, and shall foster cost-effective research mechanisms, including the joint funding of research.

(3) MEMBERSHIP.—The Interagency Committee shall include representatives from the Department of Commerce (including the National Oceanic and Atmospheric Administration and the National Institute of Standards and Technology), the Department of Energy, the Department of the Interior (including the Minerals Management Service and the United States Fish and Wildlife Service), the Department of Transportation (including the United States Coast Guard and the Maritime Administration), and the Environmental Protection Agency, as well as such other Federal agencies as the President may designate. The President shall designate a chairman of the Interagency Committee from among its members.

(4) OIL POLLUTION RESEARCH PLAN.—(A) Within 120 days after the date of enactment of this Act, the Interagency Committee shall submit to Congress a plan for the implementation of the research aspects of the oil pollution research and development program established pursuant to subsection (b). The research plan shall—

(i) identify agency roles and responsibilities;

(ii) assess the current status of knowledge on oil pollution technologies and effects;

(iii) identify significant research gaps and priorities;

(iv) review responses to oil discharges over the past 20 years, identify major technological deficiencies in those responses, and establish research priorities to address those deficiencies;

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(v) estimate the resources needed to conduct the oil pollution research and development program established pursuant to subsection (b), timetables for completing research tasks, and, to the extent feasible, expected industry, university, research institution, and foreign nation participation in the research and development program including joint funding mechanisms; and

(vi) identify a lead agency for carrying out effects research under subsection (b)(4).

(B) The agency which is represented by the Chairman of the Interagency Committee shall contract with the National Academy of Sciences to—

(i) provide advice and guidance in the preparation and development of the research plan; and

(ii) assess the adequacy of the plan as submitted, and submit a report to Congress on the conclusions of such assessment.

The National Institute of Standards and Technology shall provide the Interagency Committee with advice and guidance on issues relating to quality assurance and standards and measurements relating to its activities under this section.

(b) Oil Pollution Research and Development Program.—

(1) Establishment.—The Interagency Committee shall coordinate the establishment, by the agencies represented on the Interagency Committee, of a program for conducting oil pollution research and development, as provided in this subsection.

(2) Innovative oil pollution technology.—The program established under this subsection shall provide for research, development, and demonstration of new or improved technologies which are effective in preventing or mitigating oil discharges and which protect the environment, including—

(A) development of improved designs for ships and facilities, and improved operational practices;

(B) research, development, and demonstration of improved technologies to measure the ullage of a vessel, prevent discharges from tank vents, prevent discharges during lightering and bunkering operations, contain discharges on the deck of a vessel, and otherwise contain discharges of oil from vessels and facilities;

(C) research, development, and demonstration of new or improved systems of mechanical, chemical, biological, and other methods (including the use of dispersants and bioremediation) for oil recovery, cleanup, and disposal;

(D) research, in consultation with the National Response Team, to improve the industry's and government's ability to respond quickly and effectively to oil discharges, including research to improve information systems for decisionmaking;

(E) development of technologies and methods to protect public health and safety from oil discharges, including the population directly exposed to an oil discharge and response personnel performing cleanup activities;

(F) research and development of methods to restore and rehabilitate natural resources damaged by oil discharges;

(G) a demonstration to evaluate the relative effectiveness and environmental impacts of bioremediation technologies, including comparisons between bioremediation techniques that rely on the introduction of microorganisms and those that rely on the enhancement of indigenous microorganisms;

(H) research on the environmental effects of the use of technologies to prevent or mitigate oil discharges; and

(I) research on means for improving navigational systems on tankers, and a report, to be included in the first submission to Congress under subsection (e), containing an assessment of currently and potentially available navigational systems (including sonar and electronic chart display), and containing a plan with schedules to require or promote the use of appropriate systems.

(3) OIL POLLUTION TECHNOLOGY EVALUATION.—The program established under this subsection shall provide for oil pollution prevention and mitigation technology evaluation, including—

(A) the evaluation and testing of technologies developed independently of the research and development program established under this subsection;

(B) the establishment, where appropriate, of standards and testing protocols traceable to national standards to measure the performance of oil pollution prevention or mitigation technologies; and

(C) the use, where appropriate, of controlled field testing to evaluate real-world application of oil discharge prevention or mitigation technologies.

(4) OIL POLLUTION EFFECTS RESEARCH.—The program established under this subsection shall provide for research on the environmental effects of oil discharges, including—

(A) the development of improved models and capabilities for predicting the effects of oil discharges and the fate and transport of such oil;

(B) the development of methods, including economic methods, to assess damages to natural resources resulting from oil discharges;

(C) the identification and mapping of environmentally sensitive areas at particular risk to oil discharges;

(D) the collection of environmental baseline data in such areas for the determination of potential effects of oil discharges, including data on chronic oil discharges; and

(E) the development of plans for long-term monitoring of environmental effects in those areas, to be implemented in the event of a major oil discharge.

(5) SPECIAL STUDIES.—(A) The program established under this subsection shall include a 10-year comprehensive monitoring and research program by the Secretary of Commerce, in consultation with the Administrator of the Environmental Protection Agency, to determine the long-term environmental effects of the oil discharges by the Exxon Valdez into Prince William Sound and the Gulf of Alaska, by the World Prodigy into Narragansett Bay, by the Rachel B into the Houston Ship Channel, and by the Presidente Rivera into the Delaware River.

(B) The Prince William Sound study shall include related effects in the Gulf of Alaska and determine effects on the diverse marine and estuarine habitats and living marine resources, and the results of the study shall be applied to the development of methods of protecting arctic and subarctic marine and estuarine environments from oil discharges.

(6) MARINE SIMULATION RESEARCH.—The program established under this subsection shall include research on the greater use and application of geographic and ship response simulaltion models, including the development of additional data bases and updating of existing data bases using the resources of the National Maritime Research Center. It shall include research related to the most effective use of the geographic area and vessel simulations for—

(A) response plan evaluation and certification;

(B) response team training;

(C) tanker personnel training; and

(D) evaluation of vessel traffic control systems and vessel movement controls.

(c) GRANTS.—In carrying out the research and development program established under subsection (b), the agencies represented on the Interagency Committee may enter into contracts and cooperative agreements and make grants to universities, research institutions, and other persons.

(d) INTERNATIONAL COOPERATION.—In accordance with the research plan submitted under subsection (a)(4), the

Interagency Committee shall coordinate and cooperate with other nations and foreign research entities in conducting oil pollution research and development and demonstration activities, including controlled field tests of oil discharges.

(e) Annual Reports.—The Chairman of the Interagency Committee shall submit to Congress at the close of each fiscal year a report on the activities carried out under subsections (a) through (f) of this section in the preceding fiscal year, and on activities proposed to be carried out under subsections (a) through (f) of this section in the current fiscal year.

(f) Funding.—Not to exceed $25,000,000 of amounts in the Fund shall be available annually, without fiscal year limitation, to carry out subsections (a) through (f) of this section.

(g) Regional Centers.—(1) Under the program established under this section, a minimum of 3 regional centers shall be estalbished to address issues specific to the following geographic regions and climates:

(A) Tropical and subtropical coastal environments of Florida and the Gulf Coast.

(B) Temperate coastal environments.

(C) The Alaskan coastline and other cold water climates.

(2) Each regional center shall, in cooperation with the other regional centers as appropriate, design and implement a research program and strategy for dealing with major oil spills and related environmental damage for its region. Such research strategy and program shall, as appropriate, include the following elements:

(A) Projections of potential patterns and timing of a given spill's dispersal, taking into account size and rate of spills, time of year, weather and ocean flows, and circulation patterns.

(B) Development of improved understanding of the effects of the unique meteorology of the region on the concentration and distribution of oil pollutants.

(C) Examination of the regional specific impact of spills on coastal waters and coastline areas of the region, including subregional variations.

(D) Assessment of the physiochemical interactions between seawater and the distribution of oil polllutants in various water temperatures.

(E) Research on the effects of oil on flora and funa, including the varying effects of location, dynamics, and tupe of oil spilled.

(F) The design of protocols to be followed to quantitiate groundwater countamination associated with spills, including a focus on the potential impact on drinking water supplies.

(G) Coordination with appropriate Federal agencies with major oil spill research and development responsibility, including the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the National Science Foundation, and the Department of Defense.

(3) At least one of the regional centers established under this subsection shall be able to demonstrate expertise and experience in both marine and atmospheric research, as well as multidisciplinary strengths in geology and chemistry. Such center shall have ocean-going research vessel capacity and land-based remote sensing satellite utilization capacity, and should be located in the southernmost southeastern United States in closest proximity to a living coral reef.

(4) There are authorized to be appropriated for each of the fiscal years 1990, 1991, 1992, 1993, and 1994 not to exceed $1,000,000 for each regional center established under this subsection, such funds to be derived from the Fund established under this Act.

I. Purpose of the Bill

The purposes of the bill, as reported with amendments by the Committee, are:

(1) to establish a single comprehensive system of liability for damages resulting from oil pollution;

(2) to establish a fund for the payment of compensation for such damages;

(3) to improve oil pollution prevention and response; and

(4) to establish a comprehensive and coordinated program of oil pollution prevention and mitigation research, development and demonstration.

II. Committee Actions

H.R. 3027, the Oil Pollution Prevention, Response, Liability and Compensation Act of 1989, was introduced by Hon. Glenn Anderson on July 27, 1989, and was jointly referred to the Committees on Public Works and Transportation, Merchant Marine and Fisheries, and Science, Space, and Technology. H.R. 3027 was ordered reported by the Public Works and Transportation Committee on August 3, 1989, with amendments.

The Subcommittee on Natural Resources, Agriculture Research, and Environment held hearings on H.R. 3027 on September 7, 1989.[1] The Subcommittee received testimony from Rear Admiral Joel D. Sipes, Chief of the Office of Marine Safety, Security, and Environmental Protection, U.S. Coast Guard, Department of Transportation; Erich Bretthauer, Acting Assistant Administrator, Office of Research and Development, U.S. Environmental Protection Agency ("EPA"), accompanied by Jim Makris, Director of the Chemical Emergency Preparedness and Prevention Office, U.S. EPA, and Chair of the National Response Team; John Robinson, Chief of the Hazardous Materials Response Branch, National Oceanic and Atmospheric Administration ("NOAA"), Department of Commerce; Ed Tennyson, Technology Assessment and Research Branch, Minerals Management Service, Department of the Interior; Michael Kinworthy, manager of Environmental Programs, UNOCAL, on behalf of the American Petroleum Institute; John M. Teal, Woods Hole Oceanographic Institution; F. Eugene Guest, Director, Computer Aided Operations Research Facility, Marine Safety International, National Maritime Research Facility; and Bruce R. Rosendahl, Dean and Weeks Professor, Rosenstiel School of Marine and Atmospheric Science, University of Miami.

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[1] Hearings on H.R. 3027 before the Subcommittee on Natural Resources, Agriculture Research, and Environment of the Committee on Science, Space, and Technology, U.S. House of Representatives, 101st Cong., 1st Sess. (September 7, 1989) [hereinafter cited as "Hearing"].

On September 12, 1989, a quorum being present, the Subcommittee marked up H.R. 3027, adopted two amendments and forwarded the bill as amended to the Full Committee for further consideration on a voice vote. The Committee on Science, Space, and Technology met on September 19, 1989, and favorably reported H.R. 3027 with amendments.

III. Background and Need for Legislation

A. THE OIL SPILL PROBLEM

According to the U.S. Coast Guard, the U.S. experienced between 9,000 and 12,100 oil spills in our nation's waters every year from 1973 to 1984. The vast majority of these spills were small and not cleaned up. Out of the approximately 10,000 oil spills reported in 1984, for example, only 3,100 cleanup operations were conducted, mostly by responsible parties or other non-government entities.

While most spills are small, the total amount of oil released into the U.S. marine environment from spills every year is significant, ranging from a low of 8.2 million gallons in 1977 to a high of 21.5 million gallons in 1975.[2] The National Research Council has estimated that waterborne transport accounts for about 28 percent of the total volume of oil spilled.[3]

While chronic, small discharges of oil into the marine environment are cause for environmental concern, the greatest economic and environmental damages are probably inflicted by large spills (defined as more than 1,200 bbl) caused primarily by tanker and barge accidents. Although large spills account for only a small fraction of the total number of spills, they account for most of the oil discharged. In 1983, for example, according to Coast Guard data, there were 19 large oil spills, which accounted for 0.2 percent of all spills, but which accounted for 67 percent of the total volume of oil spilled.

1. The "Exxon Valdez" and Other Recent Oil Spills

On March 24, 1989, at 12:04 a.m. the supertanker, *Exxon Valdez*, struck Bligh Reef in Prince William Sound, Alaska, and spilled more than 11 million gallons of oil. This was the largest spill in U.S. history and occurred in one of the nation's most sensitive ecosystems. The resulting contamination has adversely affected valuable natural resources in Prince William Sound and more than a thousand miles of coastline.

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[2] Since the *Exxon Valdez* spill of about 11 million gallons alone is nearly four times larger than the previously worst single U.S. oil spill, total spill volume for 1989 is expected to be significantly higher than 1975.

[3] National Research Council, Marine Board, Commission on the Effectiveness of Dispersants, *Using Oil Spill Dispersants at Sea*, Washington (National Academy Press, 1988) at 11 (hereinafter, "NRC Dispersant Report".)

The oil spread from Prince William Sound into the Gulf of Alaska, Cook Inlet, and along the Kenai Peninsula to Kodiak Island. As of July 7, 1989, conservation workers counted the carcasses of 26,807 migratory birds, 843 sea otters, 93 eagles, and twelve other birds of prey. The long-term impacts on fish and wildlife are unknown. The spill has adversely affected three units of the National Park System: Kenia Fjords National Park, Aniakchak National Monument, and Katmai National Park and Preserve. An estimated 150 miles of beach have been oiled in Katmai National Park and Preserve as well as 18 to 20 miles of beach in Kenai National Park. Cleanup crews have been working in all three units.

The Alaska Department of Fish and Game closed several commercial fisheries in areas affected by the spill. Among them were salmon, herring, crab, and shrimp fisheries in Prince William Sound; salmon, herring, and shrimp fisheries in Cook Inlet, and the herring fishery at Kodiak. The Kodiak commercial salmon season was postponed several times because of oil contamination before opening on June 19, 1989.

It has recently been reported that cleanup costs have exceeded $1.3 billion,[4] which do not include direct damages to natural resources, long-term natural resource damage, loss of income due to natural resource damage, loss of tax revenue, and other effects on the local economy.

Three significant oil spills have occurred since the *Exxon Valdez* oil spill, all within 24 hours on June 23 and 24, 1989. The first of these additional spills occurred at 4:40 p.m. on June 23, when the 531-foot Greek registered tanker, *World Prodigy*, struck a rock at Brenton Reef immediately south of Newport, Rhode Island. According to the Coast Guard, approximately 290,000 gallons of No. 2 heating oil leaked into Narragansett Bay from the ruptured tanker. The appropriate pilot for those waters was not on board. Cleanup work has been completed.

The second of these spills occurred after an oil tanker, *Rachel B*, collided with an oil barge in the Houston Ship Channel. The tanker tore a hole in the barge, spilling an estimated 250,000 gallons of heavy slurry crude oil. Much of the oil reportedly washed ashore on beaches in an industrial area.

Finally, according to the Coast Guard, an estimated 300,000 gallons of heavy No. 6 industrial heating oil spilled into the Delaware River from a Uruguayan-registered tanker, the *Presidente Rivera.* The tanker reportedly left the marked channel and ran aground.

B. ADEQUACY OF PREVENTION AND CLEANUP TECHNOLOGY

The recent rash of oil spills, and in particular the *Exxon Valdez* spill, has brought into sharp question the adequacy of existing oil pollution prevention and cleanup technologies. A Report to the President prepared by Transportation Secretary Skinner and EPA Administrator Reilly on the *Valdez* disaster concluded:

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[4] Washington Post, September 10, 1989, at A–1.

> The *Exxon Valdez* incident emphasized the need for greatly improved public and private research and development capabilities. Current response equipment is still inadequate in less than ideal conditions. Better mechanical, chemical, and biological strategies for cleanup are needed. The incident revealed how little we know about cold-water oil spill responses.[5]

Witnesses before the Subcommittee generally acknowledged that our present oil spill cleanup technologies are inadeqaute, particularly for large spills.[6] As Michael Kinworthy, the witness representing the American Petroleum Institute testified. "A realistic appraisal of the U.S. response to catastrophic spills recognizes that no effective containment of such spills has been accomplished." [7]

Oil spill pollution prevention and mitigation technologies can be divided into several areas: (1) prevention technologies; (2) mechanical containment and collection, including barriers, booms, and skimmers; (3) treatment technologies, including chemical dispersants, combustion, biodegradants, and other chemical treatment; and (4) shoreline cleanup. The *Valdez* disaster has illustrated the inadequacies of each of these response technologies.

1. Prevention Technologies

The National Response Team Report to the President reaffirmed that the "avoidance of accidents remains the best way to assure the quality and health of our environemt." [8] Agreeing, the American Petroleum Institute has issued a number of research and development recommendations aimed at preventing spills.[9] In particular, areas for research include the development of a shipboard oil spill response capability and the study of potential changes in vessel configuration and construction (e.g., ballast sides, smaller tank sizes, double bottoms.) Other ideas, such as pressurization which would prevent or slow the release of oil from tankers, deserve further study.[10]

The development of tanker computer simulators also provides promising new opportunities for training pilots to prevent accidents. Long proven in the aviation industry, simulators like those at the National Maritime Research Center can provide a center for research for the potential application of simulator training.[11]

2. Mechanical Containment and Collection

Booms and barriers deployed in marine spills are intended to provide physical barriers to prevent oil from spreading permitting more efficent oil recovery and preventing pollution of beaches. Deployed immediately after a spill, booms and barriers can be quite effective in calm seas with little wind or current. It is largely acknowledged, however, that such containment devices have little utility in the open seas, where currents are frequently above one knot and waves over 2 to 3 feet.[12] In addition, booms must be deployed quickly to be effective, a condition often defeated in remote ocean spills.

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[5] National Response Team, The *Exxon Valdez* Oil Spill: A Report to the President (May 1988) at 37 (hereinafter, "NRT Report to the President").

[6] Hearing, supra, written statement of Bretthauer at 4; written statement of Robinson at 3, written statement of Teal at 1).

[7] Hearing, supra, written statement at 8.

[8] NRT Report to the President, supra, at ES–1.

[9] American Petroleum Institute, American Petroleum Institute Task Force on Oil Spills (June 14, 1989.) (Appendix A to written testimony of Michael Kinworthy.)

[10] Hearing, supra, statements by Hon. Claudine Schneider and Rear Admiral SIpes, Tr. at 44.

[11] Hearing, supra, testimony of Guest, Tr. at 78.83.

Despite these limitations, there are some promising developments in containment technologies. The development of on-board containment systems that could be deployed immediately after a spill would obviate the need to airlift containment equipment from far-away ports.[13] A high pressure water jet barrier now under development has also been cited as a promising new technology.[14] Research in changes in the operation of booms, such as that successfully carried out by the Minerals Management Service, may also increase the utility of this containment technology.[15]

A wide variety of types of mechanical skimmers have been developed which are designed to separate and recover spilled oil from ocean water.[16] Some skimmer devices are small and generally portable, while others are mounted on, or are an integral part of, ships. Skimmers are generally limited by the same conditions that limit the utility of physical containment devices. Their efficacy is sharply reduced in rough seas, and recovery is most successful in the early stages a spill when petroleum is still non-viscous and concentrated.

When oil is recovered by mechanical devices, it must be pumped from the skimmers into temporary storage containers and transported by land for ultimate disposal. A weak "link" anywhere along this cleanup chain can seriously hamper cleanup efforts. As John Robinson, Chief of NOAA's Hazardous Materials Response Branch, testified:

> The chain of events that must proceed smoothly in oil spill control—containment, transfer, storage, and disposal—suffers from several uniformly weak links. Oil spill containment operations are often hampered by poor visibility, high winds, moderate currents, and elevated sea state. Transfer operations frequently break down when oil viscosity increases beyond the design capability of available pumps. Emulsification can readily increase the volume of spilled oil beyond the capacity of available tankage. The need for equipment that can be deployed with great speed and agility seems almost inconsistent with the requirement that it be designed to withstand oceanic forces.[17]

The Coast Guard has similarly noted the need to look at oil containment and recovery from a "systems" perspective.[18]

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[12] (See, e.g., Congressional Research Service, Spill Containment and Cleanup Technology (May 19, 1989) at 3 (hereinafter cited as "CRS Oil Pollution Technology Report"); written statement of Tennyson at 6; NRC Dispersant Report, supra, at 16).

[13] Hearing, supra, testimony of Kinworthy, Tr. at 103.

[14] CRS Oil Pollution Technology Report, supra, at 3.

[15] (Hearing, supra, written testimony of Ed Tennyson at 6.)

[16] (See, e.g., CRS Oil Pollution Technology Report, supra, at 4 through 7).

[17] Hearing, supra, written statement at 4.

[18] (Hearing, supra, written testimony of Rear Admiral Sipes at 5.)

3. Treatment Technologies

Several treatment technologies exist and are under development to mitigate the effects of an oil spill. Virtually all of the treatment technologies, however, are highly controversial, and there is general agreement that while such technologies are promising, significant additional research and development are needed both to prove the efficacy of the technologies in removing or degrading oil and to assess their environmental effects.

Dispersants

Dispersants are chemicals which break a surface oil slick into small droplets which mix principally in the upper few meters of the water column. Dispersion accelerates natural evaporation, enhances natural biodegradation of the oil by increasing the surface area available for microbial action, and reduces the toxicity of the oil by diluting it over greater volumes of water. Given the technical difficulties of containing and recovering oil spilled in the open ocean, noted above, the oil industry has taken the view that dispersants are the most promising tool for mitigating oil spills.[19] Other countries, notably Great Britain, use dispersants as standard practice in mitigating oil spills.[20]

Questions remain, however, about the environmental effects of the dispersants themselves. Prior studies, particularly after the *Torrey Canyon* spill in 1967, indicate that significant environmental damage was caused both by the toxicity of the dispersant itself and by the increased oil surface to which marine organisms were exposed.[21] As a result, the use of dispersants became highly controversial. Modern dispersants are largely non-toxic; the toxic effects of these dispersants are due almost entirely to the dispersed oil. While several dispersants have been approved by the EPA, they cannot be used at a spill unless approved by the on-scene coordinator.

As the National Response Team Report to the President states, the issue of dispersants was highly controversial in the *Valdez* incident.[22] To be effective, dispersants must be applied almost immediately after a spill has occurred. By the time that several field tests of dispersants had been conducted at the *Valdez* site to resolve the concerns of the various governmental entities, however, it was too late to apply a dispersant. As the chief of NOAA's Hazardous Materials Response Branch testified, "Lack of agreement on the effectiveness and ecological impact of dispersants has essentially removed this technology from practical application for spills in U.S. waters."[23] The *Valdez* incident underscores the importance of conducting credible scientific research before the need for the information arises.

In an attempt to resolve these disputes, the National Research Council of the National Academy of Sciences conducted a major study of dispersants, published in 1988.[24] While the report generally approved dispersants, finding that dispersants are generally less toxic than the oil itself, it also identified the research needed to resolve many of the remaining questions on the effectiveness and ecological implications of dispersant use.[25]

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[19] See, e.g., Hearing, supra, written testimony of Kinworthy at 8.

[20] CRS Oil Pollution Technology Report, supra, at 8.

[21] Ibid at 8; also see generally, NRC Dispersant Report, supra.

[22] See NRT Report to the President, supra, at 17–19; Hearing, supra, testimony of John H. Robinson, NOAA, Tr. at 26.

[23] Hearing, supra, written statement of Robinson at 5; see also written testimony of Teal at 3-4.

Combustion

In some instances, oil slicks can be ignited, burning of the spilled oil. The Minerals Management Service of the Department of the Interior has been conducting research with Environment Canada on burning oil and appears encouraged by results to date.[26] However, concerns have been raised about the effects of air toxics released during the burning and residues produced from incomplete combustion.[27] A test burn of about 19,000 barrels of oil from the *Valdez* spill resulted in complaints from Prince William Sound residents.[28]

Other treatment technologies

A number of other treatment technologies are in various states of development. Chemicals have been developed, for example, to sink oil to prevent it from reaching beaches. The effects of sunken oil on bottom life are not known. Other chemicals have been used to gel oil, to absorb it and to herd it.[29] But each method has serious limitations and questionable environmental effects.

Biodegradants are bacteria which degrade the hydrocarbons in petroleum products. Since such bacteria are ubiquitous in the environment, some researchers have proposed enhancing biological degradation by providing nutrients for the indigenous microbes. Other researchers have developed strains of microbes, both through genetic engineering and selection processes, which could be effective in degrading oil. However, the data is unclear on the effectiveness of biological remediation on open ocean spills.

4. Shoreline Cleanup and Restoration

There is general consensus that the technologies available for cleaning up beaches, once they have been oiled, are inadequate, expensive and may even cause more environmental harm than taking no remedial action at all.[30] With respect to chemical treatment of oiled beaches, NOAA has concluded, with respect to the *Valdez* spill, that "[a]fter exhaustive tests that continued through the summer, no chemical emerged that appeared in testing to hold much promise of producing results commensurate with the environmental costs associated with its use." [31] The primary beach cleanup technology employed by Exxon was the "Omni-barge", which consists of high-pressure, high-temperature water blasting.

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[24] NRC Dispersant Report, supra.

[25] Ibid at 5.

[26] Hearing, supra, written testimony of Tennyson at 7–8.

[27] NRC Dispersant Report, supra, at 17.

[28] CRS Oil Pollution Technology Report, supra, at 9.

[29] CRS Oil Pollution Technology Report, supra, at 10.

[30] NRC Dispersant Report, supra, at 17.

[31] Hearing, supra, written testimony of Robinson at 8.

Commenting on this technique, the NOAA witness at the hearing testified that—

> [T]he use of increasingly aggressive measures to remove weathered oil is currently a subject of great concern. Few biological communities can withstand the high temperature and pressure of the "Omni-barge" washing system. Questions center on whether treatment of this intensity will delay recovery of shoreline communities." [32]

Like other clean-up technologies, the efficacy of existing shoreline cleanup technologies wanes as the time after the spill increases. Over time, oil weathers and enters into subsurface shoreline sediments. If not removed, tidal action will cause the subsurface oil to be periodically re-released into the environment, resulting in a chronic exposure to wildlife and marine organisms.

Recognizing the inadequacies of existing shoreline cleanup technologies, EPA has launched a research program on bioremediation. Working with Exxon, EPA has conducted a field trial in Prince William Sound consisting of the application of nutrients to enhance the naturally-occurring microorganisms which degrade oil.[33] Preliminary results are encouraging, and larger-scale field testing will be initiated. EPA has identified bioremediation as a critical area for future research and development.

C. TECHNOLOGY EVALUATION

A number of witnesses agreed that a more systematic program to test and evaluate oil pollution prevention and mitigation technologies would be useful, and that performance standards would be useful in comparing alternative cleanup technologies. Ed Tennyson, of the Department of Interior's Minerals Management Service, noted that there are currently more than 30 different boom designs for use on the Outer Continental Shelf, and that the lack of standardized testing techniques and protocols have made it difficult to quantify the relative capabilities of the booms.[34] Private sector developers who have developed what they believe to be effective cleanup technologies have been unable to have their products evaluated for use by the federal agencies in cleanup responses. While some agencies attempt to "screen" such products, there is no coordinated effort to evaluate such technologies in a rational way.[35] The controversy surrounding the use of dispersants in the *Valdez* spill is an example of the failure to resolve scientific issues through evaluation and testing prior to the time the technologies were needed. A number of witnesses indicated the utility of controlled field-testing of cleanup technologies to verify the performance of the technologies in real-world conditions, but the use of controlled spills in the U.S. for research purposes has virtually stopped since the shut-down of the EPA OHMSETT tank testing facility last year.[36]

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[32] Hearing, supra, written testimony of Robinson at 10.

[33] Hearing, supra, written testimony of Bretthauer at 5–6.

[34] Hearing, supra, written statement of Tennyson at 6; see also testimony, Tr. at 33, 37.

[35] Hearing, supra, testimony of Bretthauer, Tr. at 55–56.

[36] Hearing, supra, written statement of Tennyson at 2; written statement of Kinworthy at 15; testimony of Robinson, Tr. at 27.

D. ENVIRONMENTAL EFFECTS

While much is known about the short-term acute effects on marine organisms of oil products relatively little is known about the long-term environmental effects of large oil spills, particularly in arctic and sub-arctic ecosystems. Prior damage assessments have, in the words of the National Research Council, "been based on sweeping assumptions about natural processes and usually lack long-term environmental data." [37] As stated by Dr. John Teal, of the Woods Hole Oceanographic Institution:

> Knowledge of the effects of this oil, stored in sediments over long periods, is very poor but is essential for proper response to oil spills. * * * We can do no more than speculate about their environmental consequences. Even the basic chemical methods for the analyzes of these compounds are poorly developed.[38]

To understand the long-range nature of environmental effects, it is critical that planned, long-term research be conducted. However, funding has not been available for research programs beyond a few years [39] and much research undertaken immediately after a spill is hastily conducted and poorly organized.[40]

The NOAA witness acknowledged that the agencies have done a "poor job" of long-term environmental monitoring,[41] and have failed to collect environmental baseline data to provide an accurate assessment of long-term environmental damage.[42] The EPA witness acknowledged that implementation of EPA's "E-MAP" program, designed to collect and assess baseline data, would be extremely useful in determining the environmental effects of oil spills.[43]

Unofficial estimates indicate that the study of the effects of the spill of the *Exxon Valdez* into Prince William Sound would cost about $4 million a year, equally divided between Prince William Sound and the Gulf of Alaska, and that the studies of the effects of the spills by the *World Prodigy* in Narrangansett Bay, the *Rachael B* into the Houston ship channel, and the *President Rivera* into the Delaware River would total $1 million a year, with the study of the spill by the *Rachael B* costing half as much as either of the other two studies. These estimates also indicate that it may be possible to complete the latter three studies in five years instead of ten years.

The lack of long-term follow-up studies at previous oil spill sites makes difficult the assessment of long-term damages. NOAA has recommended that this be an area of "high priority" for future research.[44] Since past major spills have been located outside of U.S. waters, research on the long-term environmental effects of spills and response actions would benefit from increased international research. The National Response Team recommended strengthening existing international ties and pursuing joint research and development and information sharing agreements between nations.[45]

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[37] NRC Dispersant Report, supra, at 9.

[38] Hearing, supra, written testimony at 2; see also testimony of Rosendahl, Tr. at 107.

[39] Hearing, supra, written statement of Teal at 4; testimony of Rear Admiral Sipes, Tr. at 54.

[40] Hearing, supra, written statement of Robinson at 8: "It has been clear during the *Exxon Valdez* event that hastily conceived and executed research can contribute little to resolution of operational problems."

[41] Hearing, supra, testimony of Robinson at 45–46.

[42] Hearing, supra, testimony of Bretthauer, Tr. at 49; Robinson, Tr. at 47.

[43] Hearing, supra, testimony of Bretthauer, Tr. at 48–49.

[44] Hearing, supra, testimony of Robinson at 10.

E. FEDERAL AGENCY INVOLVEMENT IN OIL SPILL RESEARCH AND DEVELOPMENT

Federal oil spill research peaked in the late 1970's declined significantly thereafter, with almost no spending in the last several years. (See following chart:)

FUNDING LEVELS FOR OIL SPILL RESEARCH AND DEVELOPMENT

[Dollars in thousands]

Year	Coast Guard	MMS	USFWS	NOAA	EPA	DOE
1979	$5,500	NA	$70	$300	NA	NA
1980	6,000	$100	70	300	$6,000	NA
1981	3,190	200	70	300	6,000	NA
1982	3,900	200	70	300	6,000	NA
1983	3,000	200	70	300	6,000	NA
1984	2,000	200	0	0	6,000	0
1985	200	400	0	0	500	0
1986	300	350	0	0	200	0
1987	0	350	0	0	500	0
1988	300	350	0	0	0	0
1989	300	850	0	0	0	0

Most of the technology presently used was developed in the 1970's. Indeed, the only interagency research program, which used EPA's Oil and Hazardous Materials Simulated Environmental Test Tank (OHMSETT), ended in the mid-1980's and the facility closed last year.[46]

Since that time, several federal agencies have continued to carry out discrete areas of research, but there is no overall coordinated research effort which could identify and address priority research needs. Agency witnesses acknowledged the need to share research information and coordinate research activities.[47]

In response to the *Valdez* spill, the agencies are moving toward the re-establishment of coordinated interagency research planning. The Coast Guard will be leading a two-day research and development planning session at the end of September, to which other federal agencies and the oil industry have been invited. The Coast Guard recognizes that "a coordinated administration research and development plan undoubtedly will consist of new initiatives which are not now included in recent budget considerations. Additional resources will be necessary to develop and implement a successful program." [48]

Following is a summary of present and prior federal agency research and development activities:

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[45] NRT Report to the President, supra, at 37; see also testimony of Tennyson, Tr. at 32.

[46] An interagency research program under the National Response Team was acknowledged to be in "limbo." Testimony of Rear Admiral Sipes, Tr. at 57.

[47] Hearing, supra, testimony of Robinson, Tr. at 56–57.

[48] Hearing, supra, written statement of Rear Admiral Sipes at 7.

1. U.S. Coast Guard

The Coast Guard is normally the first agency to arrive to the site of an oil or chemical spill on navigable waterways, and provides the Federal On-Scene Coordinator (F–OSC). As the first responder, the Coast Guard is a primary user of technologies for containing, recovering and treating spilled oil. The agency has an oil spill research facility in Groton, Connecticut, which reached the peak of its activity a decade ago. Research conducted in the past by the Coast Guard includes studies of the fate and effects of oil, containment, treatment, recovery, storage, and disposal. The Coast Guard has also been involved with improvements in ship structure, navigation, and vessel transit systems. It represents the United States in several bilateral agreements with Canada, the Soviet Union, and other countries.

2. National Oceanic and Atmospheric Administration (NOAA)

NOAA is by law one of the natural resource damage assessment trustees. The agency has been involved with outer continental shelf research for oil and gas development since 1974 along with the Department of Interior's Minerals Management Service. NOAA monitors contaminants, including those from petroleum products, in marine organisms. Within the framework of the National Contingency Plan, NOAA supplies scientific support to the National Response Team (NRT) by providing a Scientific Support Coordinator to the U.S. Coast Guard's Federal On-Scene Coordinator. In addition, the agency has mapped the sensitivity of all U.S. coastlines to oil spills, has developed computer models and data management systems for oil spill response, and has participated in contingency planning nationwide.

3. Environmental Protection Agency (EPA)

EPA has conducted very little oil spill research during the last decade. One notable exception is EPA's bioremediation study in Alaska on one of the oiled beaches. Before it was closed, the EPA operated the Oil and Hazardous Materials Simulated Environmental Test Tank (OHMSETT) in Leonardo, New Jersey. The OHMSETT facility permitted environmentally safe testing of spill cleanup methods and technologies. EPA has an extensive program in pollution prevention which could be extended to the prevention of oil spills. EPA has also expressed a desire to become more involved in cleanup technologies and ecological assessment and monitoring.

4. Department of Interior

DOI develops natural resource damage regulations and has been investigating ways to improve the regulations for damage assessment as well as measure economic effects from resource damage. The long-term effects of recovery and restoraton have also been of interest to the Department of Interior. DOI also has a number of other agencies with interests in oil spill research and development. The Fish and Wildlife Service studies acute and chronic effects of contaminants on fish and wildlife; the Minerals Management Service has responsiblity for oil spilled as a result of outer continental shelf oil drilling activities, and examines various kinds of eqauipment for spill control and recovery activities.

5. National Institute of Standards and Technology (NIST)

NIST (the nation's reference laboratory for physical sciences, engineering, and materials) has assisted DOI's Minerals Management Service in its research program and could provide an advisory role in the development of standards for measuring the effectiveness of various technologies.

E. INDUSTRY INVOLVEMENT IN OIL SPILL RESEARCH

Most of the large oil companies, including Exxon, have conducted ambitious research programs related to oil spills for over a decade. Recently, chief executive officers from several large oil companies belonging to the American Petroleum Institute (API) formed the Petroleum Industry Response Organization (PIRO) which has committed $35 millon to oil spill research and development over the next five years.[49] PIRO has expressed interest in cooperating with federal agencies to conduct joint research.

The API has conducted its own oil-related research for over 20 years. It is one of three cosponsors, along with the Coast Guard and NOAA, of a biannual oil spill conference. API indicated at the hearing its desire to work jointly and cooperatively with the federal agencies in carrying out the next generation of oil pollution prevention and mitigation research.

IV. Explanation of the Bill

A. SUMMARY

The bill has been amended by the Committee to bring together the capabilities and expertise of the Federal agencies involved with oil spill research. As amended, the bill includes the major research provisions of both H.R. 3027, as reported by the Committee on Public Works and Transportation, and H.R. 1465 as reported by the Merchant Marine and Fisheries Committee. The amended bill includes a section on interagency coordination to ensure that each agency's activities are coordinated with an overall research program and plan.

In addition, the bill as amended contains several new sections not contained in either H.R. 3027 or H.R. 1465 as reported. For example, the amended bill includes a 10-year monitoring and research program that shall be conducted by the Secretary of Commerce to evaluate the effects of the 1989 oil discharges on Prince William Sound, Narragansett Bay, Houston Ship Channel, and the Delaware River. The bill as amended also requires the National Maritime Administration to expand its marine simulation research. The bill also authorizes the Federal agencies which are members of the Interagency Committee to provide grants for independent research and development. Finally, the bill provides for the establishment of at least 3 regional oil spill response research centers.

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[49] Hearing, supra, see generally testimony of Kinworthy, Tr. at 63–69.

B. INTERAGENCY COORDINATION

The witnesses testifying before the Subcommittee generally acknowledged that Federal coordination for oil pollution research was essential, but lacking at this time. Erich Bretthauer, the witness testifying on behalf of the EPA stated that "Because of the wide and varied interest, future Federal research must be coordinated to prevent duplication of effort." [50] Admiral Sipes stated that the National Response Team had a research and development committee but that it was in "limbo." [51] In response to the spill by the *Exxon Valdez*, both industry and the Federal agencies are moving toward the re-establishment of research planning, but the coordination mechanisms that existed in the 1970's and early 1980's are no longer in place.

Fragmentation and duplication of research is wasteful and ineffective. Accordingly, section 211 of this bill as amended addresses this problem by establishing an Interagency Coordinating Committee on Oil Pollution Research (hereinafter referred to as the Interagency Committee), consisting of specified Federal agencies that traditionally have conducted oil spill research, as well as such other agencies as the President may designate. A single entity provides the Federal oil pollution research program with a centralized mechanism for ensuring that the activities of each agency are complementary and relevant to overall goals and objectives of a comprehensive research progam.

While it is intended that each agency should retain its expertise in specific areas of oil pollution research and development, the Interagency Committee is intended to encourage each agency to view its own programs in the context of the total research program. In areas of overlapping responsibilities, the Interagency Committee should address agency roles and avoid duplication in the research plan.

The Interagency Committee also provides a vehicle for Federal agencies to communicate and coordinate research with industry, universities, and other nations. It is the Committee's intent that the Federal government, private sector, and university community work together as much as possible to conduct cooperative research in this area. Cooperative efforts not only leverage federal research dollars, but also avoid the controversy over scientific research that often arises when federal agencies and private industry conduct separate research programs. A jointly-funded, cooperative research program should help create the needed scientific consensus on oil spill clean-up technologies before the technologies are needed.

Under section 211 as amended the Chairman of the Interagency Committee will be designated by the President. By allowing for only one chairman, the Committee does not intend to imply that the research agenda of the Chair agency should be the research agenda of the plan submitted to Congress. The Committee fully anticipates that other agencies, should and will play a significant role in the development of the Oil Pollution Research Plan. For example, the Committee notes the acknowledged expertise of the National Institute of Environmental Health Sciences in the area of human health effects caused by environmental pollution. Areas of potential oil pollution research overlap clearly exist and should be resolved by the interagency coordination mechanism established in the amended bill.

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[50] Hearing, supra, Tr. at 23.

[51] Hearing, supra, Tr. at 57.

C. RESEARCH PLAN

The Interagency Committee shall submit to Congress within 120 days after the enactment of this Act a research plan that will outline the development of the Oil Pollution Research and Development Program. The research plan shall identify agency roles and responsibilities; assess the current status of knowledge on oil pollution technologies and effects; identify significant research gaps and priorities; review past responses to oil discharges and identify technological deficiencies; and estimate the resources needed to conduct the oil pollution research and development program, including timetables for completing research tasks.

Major oil spills can occur almost anywhere, in any environment, and under a variety of adverse conditions. To ensure that a wide range and variety of environments are considered, the research program shall include in the assessment of the current status of knowledge on oil pollution technologies, an analysis of the adequacy of oil pollution response to spills in both fresh and salt water resources, including major river systems, the Great Lakes, major urban harbors and bays, the Gulf stream, and areas where wetlands are present and particularly vulnerable. The research plan shall also identify environments that pose significant technological problems for adequate containment and mitigation of an oil spill and assess the current status of knowledge on oil spill response in these environments. This review should be conducted as part of an analysis of major oil spill response efforts and their technological deficiencies over the last 20 years.

Industry, university, research institution, and foreign nation participation in the development of this plan should occur whenever possible. The research plan should also identify areas where cooperative research and joint funding should be developed between the Federal Government and industry, university, research institution, or other nations.

In addressing the current state of technology, the Interagency Committee must look back to the late 1970's, when oil spill research peaked, and evaluate what was known then and compare it to what is currently known. The technologies that are addressed in the review should include mechanical, chemical, biological, thermal, and other types that have been used or tested. The status report should also include a description of the effect that these technologies have had when applied during containment, treatment, or cleanup of a spill.

The Committee is particularly concerned that research conducted during the 1979's on bioremediation technologies, both for open water and shoreline remediation, has not been applied in recent oil spill efforts. It is not clear whethe the agencies are unfamiliar with such research or believe that additional research is necessary. Therefore, the research plan should include a section which evaluates the relative effectiveness and environmental impact of existing bioremediation technologies, and identify those areas which should receive additional research.

To provide an independent review of the adequacy of the research plan, section 211(a)(4)(B) directs that the research plan be prepared with the advice and guidance of the National Academy of Sciences (Academy) and NIST. The agency from which the chairman is designated shall have the responsibility for contracting with the Academy. The Academy would provide advice and guidance in the preparation of the research plan; and assess the adequacy of the plan as submitted. The Academy would also submit a report to Congress on the conclusions of the assessment. NIST shall also provide the Interagency Committee with advice and guidance on issues relating to its development of the research plan and implementation of the oil pollution research and development program. NIST should play an important role, particularly in providing a focus for evaluation technoligies for use in oil spill prevention or mitigation.

D. OIL POLLUTION RESEARCH AND DEVELOPMENT PROGRAM

Section 211(b) sets out five major components of the Oil Pollution Research and Development Program.

1. Innovative Oil Pollution Technology Program

The first component is the Innovative Oil Pollution Technology Program. This program shall provide for research, development, and demonstration of new or improved technologies which are effective in preventing or mitigating oil discharges. The technologies must also protect the environment and not degrade the quality of the environment. In particular, clean-up technologies which result in greater damage to the environment than that caused by the oil pollution itself should be discouraged.

This program is intended to stimulate research and development on a wide range of technologies to prevent oil spills and mitigate their effects. A technology that is developed to prevent an oil spill could include, for example, improved simulation training and preparation for tanker pilots and crew, enhanced navigational and tanker piloting systems, improved vessel design, improved loading facility design, and other similar improvements that would reduce the likelihood of an oil spill from occurring. A technology that is developed to mitigate an oil spill could include: improved response by cleanup personnel; improved containment, cleanup, and treatment methods (mechanical, chemical, biological, combustion, and other methods); enhanced information systems for decision making; improved methods to restore and rehabilitate natural resource damage; improved methods to clean oiled animals; improved technologies that would slow down the flow of oil from the vessel; and other technologies that would be useful after a spill has occurred to reduce both its effect and its presence in the environment.

This section also requires the Interagency Commiittee to report in its first annual report containing an assessment of currently and potentially available navigational systems (including sonar and electronic chart display), and continaing a plan with schedules to require or promote the use of appropriate systems.

It is the Committee's intent that the EPA should continue and expand its ongoing shoreline bioremediation research which shall include research on environmental restoration technology which enhances the recovery of shoreline ecosystems impaired by oil pollution including, but not limited to: evaluation, testing and field demonstration of the performance of shoreline restoration techniques; and evaluation of environmental impacts associated with restoration techniques. The Committee encourages EPA to conduct this program in cooperation with university researchers and private firms that have developed biological treatment technologies.

2. Oil Pollution Technology Evaluation Program

Section 211(b)(3) provides for oil pollution prevention and mitigation technology evaluatuon. There is currently no existing program that will evaluate technolgy "effectiveness." This program will be set up to evaluate technologies developed by the Federal Government as well as by independent inventors. Evaluation should include previously developed technolgies developed by private businesses of public institutions. There should be a centralized location whcih can direct private sector developers to the appropriate agency for technology testing and evaluation. NIST should be involved in the development of protocols for technology evaluation. The public should be involved in this evaluaiton process, particularly when chemicals are being evaluated. The Federal agencies should also make use of field testing where appropriate, the evaluate real-world application of oil discharge prevention or mitigation technologies. This includes national and international field testing.

3. Oil Pollution Effects Research Program

Section 211(d) establishes the Oil Pollution Effects Research Program. Witnesses agreed that the long-range impacts of oil pollution are poorly understood.[52] Areas that are sensitive and at particular risk to an oil spill will be identified and mapped. Entire coastlines cannot be protected from the impacts of an oil discharge, but plans should be developed to protect those areas that are ecologically sensitive and at particular risk. Plans for long-term monitoring of environmental effects in those areas are to be developed and implemented in the evant of a major oil discharge.

4. Special Studies

This Special Studies program will include a 10-year comprehensive monitoring and research program by the Secretary of Commerce, acting through NOAA and in cooperation with the EPA, to determine the long-term effects of the oil discharges by the *Exxon Valdez* into Prince William Sound, by the *World Prodigy* into Narragansett Bay, by the *Rachael B* into the Houston Ship Channel, and by the *Presidente Rivera* into the Delaware River. There was agreement by the witnesses that research at sites of past spills would be useful in understanding the long-term environmental effects of oil pollution.

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[52] See, e.g., Hearing, supra, testimony of Rosendahl at Tr. 107, Teal at Tr. 71.

5. Marine Simulation Research

Section 211 (b)(6) directs research on the greater use and application of geographic and ship response models. Research in the application of simulators to training and certification of ships was conducted by the Computer-Aided Operations Research Facility (CAORF) of MarineSafety International from 1978 to 1985. During the hearing, Dr. F. Eugene Guest Director of CAORF, stated that "The research indicated a definite role for simulators in the training of ship officers and pilots in the dynamic training for maneuvering decision-making. That research basically is unfinished and unapplied as of the time of the *Exxon Valdez*." [53]

The program should continue the research that ended in 1985 and seek ways to apply what was learned. The program should also include research related to the most effective use of the geographic area and vessel simulations for: response plan evaluation and certification; response team training; tanker personnel training, and an evaluation of vessel traffic control systems and vessel movement controls. The Committee believes that the research performed by CAORF would be effective in reducing the number of oil spills that occur because of human error. The Committee enourages the Maritime Administration to make greater use of this facility.

E. GRANTS

The Federal agencies represented on the Interagency Committee are authorized to enter into contracts and cooperative agreements and make grants to universities, research institutions, industry and other persons to carry out the Oil Pollution Research and Development Program. This section is intended to provide the agencies with flexible authority to enter into appropriate research arrangements with the private sector and universities including the use of joint funding where appropriate.

F. INTERNATIONAL COOPERATION

The Committee encourages the Interagency Committee to coordinate and cooperate with other nations and foreign research entities in conducting oil pollution research, development, and demonstration activities, including participation in controlled field tests of oil discharges. The Committee believes that other nations have developed significant expertise in responding to oil spills and the federal agencies should expand their efforts to draw upon that experience.

G. ANNUAL REPORTS

The Chairman of the Interagency Committee shall submit to Congress at the close of each fiscal year (before January 1 of the next year) a report on the activities carried out under this section in the preceding fiscal year, and on activities proposed to be carried out under this section in the current fiscal year.

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[53] Hearing, supra, Tr. at 81.

H. AUTHORIZATION OF APPROPRIATIONS

The amended bill authorizes $25 million to be appropriated annually without fiscal year limitation to carry out this section from the Oil Spill Liability Trust Fund established under Section 9509 of the Internal Revenue Code of 1986.

I. REGIONAL RESEARCH CENTERS

The Committee recognizes that the characteristics of oil spills and the types of damage that can be inflicted by oil pollution varies widely across the various ecosystems and climate zones of the United States. Response to oil spills in the subarctic regions of Alaska, for example, are like to be different than responses in tropical or subtropical areas. To address these regional oil spill response research issues in the most cost-effective manner, research needs to be coordinated on a regional basis. Regional research should also draw upon the expertise on local and regional issues existing in universities and research facilities located in those geographic regions.[54]

Accordingly, section 211(g) establishes a minimum of three regional oil spill response research centers in each of three regions: tropical and subtropical coastal environments of Florida and the Gulf Coast, temperate coastal environments, and the Alaskan coastline and other cold water climates. The regional centers shall design and implement a research program and strategy for dealing with major oil spills, taking into account the various regional elements that will affect oil spill effects and response. The centers shall coordinate with appropriate federal agencies with major oil spill research and development responsibility. The bill authorizes $1 million for each center for the fiscal years 1990 and 1994, to be derived from the Fund.

J. DESIGNATED CHAIN OF COMMAND

The Committee also adopted an amendment to section 202(c), which sets out the contents of response plans required to be prepared under the bill. The amendment directs the response plans to include "a clearly designated chain of command and authority" to carry out the response plan. The amendment stems from experience in the response to the *Exxon Valdez* spill in which there was a fundamental breakdown in command resulting from an unclear hierarchy of responsibility. This led to several days of inaction, and thus, greatly exercerbated the problem as agencies disputed authority. The amendment seeks to ensure that a single individual is given executive authority to act in the case of future oil spill disasters.

V. SECTIONAL SUMMARY OF THE AMENDMENT TO THE BILL

Section 211. Oil Pollution Research and Development Program.

Section (a) Interagency Coordinating Committee on Oil Pollution Research.—This section establishes an Interagency Coordinating Committee on oil pollution research to coordinate research, development, and demonstration among the Federal agencies, industry, research institutions, and other nations. The Chairman of the Interagency Committee shall be appointed by the President. A research plan will be submitted by the Interagency Committee within (20 days that will identify agency roles and responsibilities, and research priorities. The National Academy of Sciences and the National Institute of Standards and Technology will advise the Interagency Committee on the preparation and development of the research plan.

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[54] Hearing, supra, testimony of Rosendahl, Tr. at 88.

Section (b). Oil Pollution Research and Development Program.

Section (b)(1). Establishment.—The Interagency Committee shall coordinate the program for conducting oil pollution research and development.

Section (b)(2). Innovative oil pollution technology.—New or improved technologies that would be effective in preventing or mitigating oil discharges and would protect the environment would be researched, developed and demonstrated. The enviromental effects of the use of these technologies to prevent or mitigate oil discharges would be researched. The research would be done in consultation with the National Response Team to enhance government and industry ability to respond quickly to oil discharges.

Section (b)(3). Oil pollution technology evaluation.—Technologies developed for the purposes of prevention or mitigation would be evaluated for their efficacy. The use of controlled field testing (where appropriate) to evaluate real-world application of oil discharge prevention or mitigation will also be supported through this program.

Section (b)(4). Oil pollution effects research.—Research on the short-term and long-term environmental effects of oil discharges will be performed. Improved models for predicting the fate, transport, and effects of oil discharges will be developed. Areas that are particularly sensitive and at risk to oil discharges will be identified and mapped. Baseline data will be gathered in areas sensitive and at risk to oil discharges to determine what is there before damage occurs from an oil discharge. Plans for a long-term monitoring of area sensitive and at risk are to be developed for implementation in the event of a major spill. Models will be developed for predicting the fate and effects of discharged oil.

Section (b)(5). Special studies.—The subsection requires the Secretary of Commerce establish a 10-year comprehensive monitoring and research program to determine the long-term effects of the oil discharged by 1989 spills in Alaska, Rhode Island, Delaware, and Texas.

Section (b)(6). Marine simulation research.—Research shall be performed on the greater use and application of geographic and ship simulation models. This research would benefit response plan and evaluation certification; response team training; tanker personnel training; and evaluation of vessel traffic control systems and vessel movement controls.

Section (c). Grants.—The agencies represented on the Interagency Committee may enter into contracts and cooperative agreements and make grants to universities, research insitutions, and other persons.

Section (d). International cooperation.—The Interagency Committee shall coordinate and cooperate with other nations and foreign research entities in conducting oil pollution research and development and demonstration activities, including controlled field tests of oil discharges.

Section (e). Annual reports.—The Chairman of the Interagency Committee shall submit to Congress at the close of fiscal year a report on the activities carried out under this section in the preceding fiscal year, and on activities proposed to be carried out under this section in the current fiscal year.

Section (f). Funding.—Amounts in the Oil Spill Liability Trust Fund, not to exceed $25,000,000 shall be available annually, without fiscal year limitation, to carry out this section.

Section (g). Regional centers.—A minimum of three regional oil spill response research centers shall be established to address oil spill issues relating to three different geographic regions and climates. The centers shall coordinate with appropriate Federal agencies conducting oil spill research. The bill authorizes $1 million for each of the five fiscal years beginning in 1990 for each center from the Fund.

Section 202(c). Chain of command.—Requires the response plans to include a clearly designated chain of command and authority to carry out the response plan.

VI. CONGRESSIONAL BUDGET ACT INFORMATION

The bill provides for new authorization rather than new budget authority and consequently the provisions of section 308(a) of the Congressional Budget Act of 1974 are not applicable.

VII. COMMITTEE COST ESTIMATE

In accordance with the requirements of section 252(b) of the Legislative Reorganization Act of 1970 and pursuant to rule XIII, clause 7 of the Rules of the House of Representatives, the Committee estimates the costs to be incurred by the Federal Government during the current and five subsequent years as a result of the enactment of this legislation as follows:

Fiscal year:	*Millions*
1989	$25
1990	25
1991	25
1992	25
1993	25
1994	25

VIII. EFFECT OF LEGISLATION ON INFLATION

In accordance with rule XI, clause 2(l)(4) of the Rules of the House of Representatives, the provisions of this legislation within the Committee's jurisdiction are assessed to have no inflationary impact on prices and costs in the national economy.

IX. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

The provisions of the bill within the Committee's jurisdiction, as reported, make no changes in existing law.

X. OVERSIGHT FINDINGS AND RECOMMENDATIONS

Pursuant to rule XI, clause 2(l)(3) of the Rules of the House of Representatives, and under the authority of rule X, clause 2(b)(1), and clause 3(f), the results and findings of oversight activities considered by the Committee on Science, Space, and Technology have been adopted and are incorporated in the recommendations found in the present bill and report.

XI. OVERSIGHT FINDINGS AND RECOMMENDATIONS, COMMITTEE ON GOVERNMENT OPERATIONS

No findings or recommendations on oversight activities pursuant to rule X, clause 2(b)(2), and rule XI, clause 2(l)(3)(D), of the Rules of the House of Representatives have been submitted by the Committee on Government Operations for inclusion in this report.

XII. COMMITTEE RECOMMENDATION

A quorum being present, the Committee favorably reported the bill H.R. 3027 as amended by voice vote, and recommends its enactment.

XII. DISSENTING VIEWS

One of the charges of the Science, Space and Technology Committee should be to ensure that good scientific information is made available to decision makers. Because it is so important that this information be valid and objective, it is critical that the process to determine who will do the scientific research also be valid and objective.

Therefore, it is unfortunate that during full Committee consideration of H.R. 3027, an amendment was adopted to establish oil spill research centers without peer review or competition. Furthermore, the need for such centers was never made clear in the first place, since the bill already contains a university grant program which could have accomplished the same purpose with greater oversight and coordination. Certainly the entire concept would have benefited from additional study.

Peer review and competitive selection of research proposals are essential to preserving the integrity of the scientific process. Thus, it is important to avoid the use of selection criteria, such as those contained in this provision, which are so overly restrictive that only specific universities would qualify. Of the three centers created by this provision, it is almost certain that one would be located at the University of Miami and the other at a university in Alaska. The other 48 states would be left to fight over the single remaining center.

In fact, the priority of locating a center in a subtropical and tropical region has never been fully documented. Recent figures from the Coast Guard indicate that only 3.7 percent of the oil spilled in the United States was in the Gulf region, whereas 40.5 percent of it was spilled in the Atlantic, and 29.5 percent of it spilled inland or in the Great Lakes. Therefore, we are disappointed that the substitute amendment to first study the centers proposal was not adopted instead. Such a study would have provided us with necessary background information to help determine the need for or design of a centers program.

If a need for centers is established, the correct procedure for locating them is obvious: if a particular university is the best qualified to conduct the research, then it should welcome competitive review; if it is not qualified, then it should not get the money. Earmarks produce fragmented and specialized research of dubious value to decisionmakers as a whole. That is why it would be more appropriate to consider this amendment as part of a comprehensive review of a national centers program. Such legislation is currently pending before our Committee.

Because of problems with the centers provision, we hope that the Committee will take advantage of any opportunity that arises to correct this provision through an alternative approach.

Claudine Schneider.
Don Ritter.
Sherwood Boehlert.
F. James Sensenbrenner.
Dana Rohrabacher.
Connie Morella.
Bob Walker.
Steven Schiff.
Sid Morrison.
Ron Packard.
Christopher Shays.
D. French Slaughter, Jr.
Lamar Smith.
Harris W. Fawell.
Robert C. Smith.
Jack Buechner.
Paul B. Henry.
Tom Campbell.

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